What is claimed is:

1. A method for orienting a semiconductor wafer (W) during semiconductor fabrication with the aid of an optical alignment system (10), the semiconductor wafer (W) having an alignment mark (M) with regular structures (M_1, M_2, M_3), on the basis of which the position of the semiconductor wafer (W) can be determined, having the following method steps:

a) determination of a first position information item (x_1, y_1) of the alignment mark (M) in a predetermined direction (X, Y) with the aid of an optical measurement method that is optimized for position determination;

b) determination of a line profile (S_A) of the alignment mark (M) in the predetermined direction (X, Y) with the aid of an optical measurement method that is optimized for profile determination;

c) determination of a second position information item (x_2, y_2) of the alignment mark (M) in the predetermined direction (X, Y), the first position information item (x_1, y_1) determined in method step a) being corrected with the aid of the line profile (S_A) of the alignment mark (M) determined in method step b); and

d) use of the second position information item (x_2, y_2) of the alignment mark (M) for a positioning and/or a modeling of the semiconductor wafer (W).

2. The method as claimed in claim 1, method step a) comprising the following substeps:

aa) scanning of the alignment mark (M) in the predetermined direction (X, Y) with the aid of an alignment microscope (21), the alignment mark (M) being illuminated with light radiation (23) from a light source (22), and an optical parameter of the light radiation (23), which is influenced by the alignment mark (M), being measured in a spatially resolved manner

in dependence on the relative position of the alignment mark (M) with respect to the alignment microscope (21);

ab) generation of an intensity profile (S_I) of the optical parameter for the alignment mark (M) in the predetermined direction (X, Y), relative positions of the alignment mark (M) with respect to the alignment microscope (21) being determined in the case of which the optical parameter exceeds or falls below a predetermined threshold value; and

ac) calculation of the first position information item (x_1, y_1) of the alignment mark (M) in the predetermined direction (X, Y) with the aid of the intensity profile (S_I) determined in method step ab).

3. The method as claimed in claim 2, the intensity, the phase and/or the polarization of the light radiation (23) influenced by the alignment mark (M) being measured as the optical parameter in substep aa).

4. The method as claimed in Claim 1, method step b) comprising the following substeps:

ba) scanning of the alignment mark (M) in the predetermined direction (X, Y) with the aid of an optical scattered radiation measuring device (30), the alignment mark (M) being illuminated with light radiation (33) from a light source (32) and a diffraction pattern which arises as a result of the interaction of the light radiation (33) with the regular structures (M_1, M_2, M_3) of the alignment mark (M) being detected; and

bb) determination of the line profile (S_A) of the alignment mark (M) in the predetermined direction (X, Y) from the diffraction pattern detected in substep ba), the diffraction pattern being evaluated with the aid of a data processing device (40) and/or being adjusted with diffraction patterns from a database (42).

5. The method as claimed in Claim 1, in method step c), the second position information item (x_2, y_2) of the alignment mark (M) being calculated with the aid of the two profiles (S_I, S_A) determined by a procedure which effects the determination of an offset (Δx, Δy) between the position (x_I, y_I) of a first region, which, in the measured intensity profile (S_I), determines the position of the alignment mark (M) and is dependent on the course of the line profile (S_A), and the position (x_A, y_A) of a second region, which is selected according to a predetermined criterion from the line profile (S_A) and is largely independent of the course of the line profile (S_A), and the addition of the offset (Δx, Δy) to the first position information item (x_1, y_1) of the alignment mark (M).

6. The method as claimed in Claim 1, the first optical measurement method using an edge contrast, phase contrast, diffraction contrast and/or Fresnel zone method.

7. The method as claimed in Claim 1, the regular structures (M_1, M_2, M_3) comprising line or point grids oriented orthogonally with respect to the predetermined direction (X, Y).

8. The method as claimed in Claim 1, the orientation of the semiconductor wafer (W) taking place with the aid of at least two alignment marks (M, M') arranged on the wafer surface.

9. An apparatus for carrying out a method as claimed in Claim 1 having an optical alignment system (10) for determining the position of an alignment mark (M), which is arranged on the surface of the semiconductor wafer (W) and has regular structures (M_1, M_2, M_3), the optical alignment system (10) comprising the following devices:

- a first optical measuring device (20) for determining a first position information item (x_1, y_1) of the alignment mark (M) in a predetermined direction (X, Y) with the aid of an optical measurement method that is optimized for position determination,

- a second optical measuring device (30) for determining a line profile (S_A) for the alignment mark (M) in the predetermined direction (X, Y) with the aid of an optical measurement method that is optimized for line profile determination, and

- a positioning device (50) for setting the relative position of the semiconductor wafer (W) with respect to the first and/or second optical measuring device (20, 30).

10. The apparatus as claimed in claim 9, the first optical measuring device (20) having an alignment microscope (21) for scanning the alignment mark (M) and measuring an optical parameter of a light radiation (23) influenced by the alignment mark (M).

11. The apparatus as claimed in claim 9, the second optical measuring device (30) comprising an optical scattered radiation measuring device (30) for detecting diffraction patterns which are caused by the interaction of light radiation (33) from a light source (31) with the regular structures (M_1, M_2, M_3) of the alignment mark (M).

12. The apparatus as claimed in one of claim 9, a data processing device (40) being provided in order to determine a second position information item (x_2, y_2) of the alignment mark (M) from the first position information item (x_1, y_1) and the line profile (S_I, S_A).

13. The apparatus as claimed in claim 12, the data processing device (40) being designed to determine the

line profile (S_A) of the alignment mark (M) from the diffraction patterns.

14. The apparatus as claimed in claim 13, the data processing device (40) having a comparison device (41) in order to adjust the diffraction patterns determined with diffraction patterns of a database (42).

15. The apparatus as claimed in one of claim 9, the optical alignment system (10) being arranged within a lithography installation (60).